focus

by the American Geographical Society

ALICE TAYLOR, EDITOR

VOL. VI, NO. 5, January, 1956

Antarctica

To the man in the street, Antarctica means ice, expeditions, and penguins. For those who would know more, five facts should be kept in mind: Antarctica is a continental land mass veneered with ice; it is the most isolated of all the continents; only a part of it has ever been seen by man; it is virtually lifeless except on its seaward rim; and, finally, it is the coldest place on earth.

Despite our meager knowledge of Antarctica, it is certain that no native human populations exist there; nor have any signs of the existence of primitive man been discovered. The intense cold alone precludes native human settlement. The lowest recorded temperature is –72° F., but it is probable that winter temperatures at the South Pole are much lower.

Antarctica cannot be broken down into north, south, east, and west. No land mass of equal size anywhere on earth is so similar in all its parts. With a total area of 5½ million square miles, it is almost as large as the United States and Europe combined. More than 95 per cent of the continent lies within the Antarctic Circle. In shape it is almost a perfect circle, with the exception of two deep indentations and one peninsula. The entire continent is covered with a mantle of ice, most of it several thousand feet thick, which is pierced in many places by mountain ranges as high as the Alps, and by isolated rock masses called nunataks. It is probable that Antarctica has the highest average elevation of all the continents. The South Pole itself is on a plateau 9,000 feet high.

This knowledge of Antarctica has been only recently acquired. The mainland was first sighted in 1820, almost simultaneously by Americans, British, and Russians. An American sealing captain, Nathaniel Palmer, sighted the coast of what is now known as the Palmer Peninsula. The British Captain Bransfield may have sighted the same peninsula a few months earlier. But Bransfield's log is lost and Palmer's is not, and existing records indicate that Bransfield may have sighted islands which he mistook for the mainland. Such was the case with the Russian Admiral Fabian von Bellingshausen. In 1940 the dog team explorations of Finn Ronne and Carl Eklund proved that the land which he sighted almost at the same time as Palmer was actually a large island.

Antarctica has been recognized as a continent for scarcely more than a century. Man did not set foot on it until 1895, and not until the twentieth century did expeditions begin to penetrate beyond the coast line. Only in 1947 was it conclusively proved to be a single land mass, by the air explorations of Finn Ronne's American expedition.

The brief history of Antarctic exploration includes many stories of hardship and heroism. It is the

Copyright, 1956, by the American Geographical Society of New York

irony of fate that some of the most deserving, most experienced, most courageous, and most admirable explorers failed tragically. Scott and Shackleton are the names that shine above all others in Antarctica's Hall of Fame, and deservedly so, for they were leaders and great men in the deepest sense. Yet Scott's body lies entombed in the polar ice, and Shackleton escaped disaster only by a 700-mile journey in an open boat. It was the irascible Norwegian Roald Amundsen who won the race to the South Pole by having the foresight to use dog teams instead of manpower. Other noteworthy achievements in Antarctic exploration include those of Sir Douglas Mawson, Sir Hubert Wilkins, who made the first flight, the master organizer Richard E. Byrd, and the dynamic Finn Ronne, and the splendid teamwork accomplishments of the British Falkland Islands Dependencies Survey as well as of the Scandinavian-British Queen Maud Land Expedition.

Expeditions led to territorial claims. These claims are in the shape of pie slices, with their apex at the South Pole. Some of them overlap, and this has led to disputes, which, so far, have been confined to the diplomatic level. Great Britain, Chile, and Argentina all maintain bases on the Palmer Peninsula.

Extensive exploration will take place in Antarctica in the next few years, in connection with the International Geophysical Year, 1957–58. The largest projects will be carried out by the United States, by the Soviet Union, and by Great Britain and other Commonwealth nations. Other participating nations include Norway, France, Chile, and Argentina. More than 30 stations will be established on the continent and adjacent islands.

A British Commonwealth exploratory effort, to take place in the near future, will include the first transcontinental land journey ever attempted in Antarctica.

Present Soviet activity in the South Polar regions is unknown, beyond the fact that Russian whaling ships visit the southern oceans each year. However, recent announcements have disclosed that Soviet Antarctic participation in the International Geophysical Year will be on a scale second only to the American effort. The Russians will establish three bases, two of which will be deep in the interior of the continent.

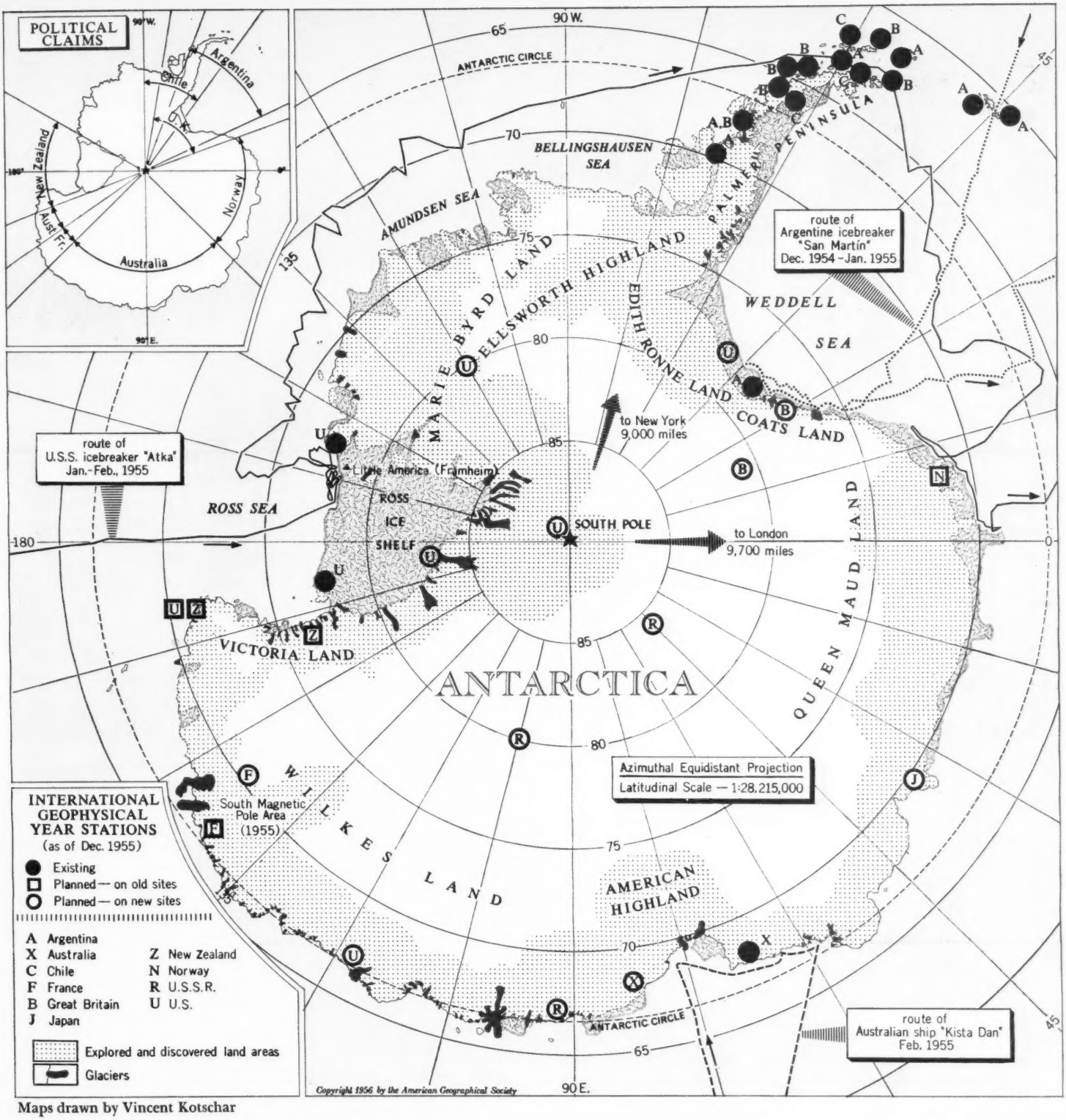
The United States claims no slice of the Antarctic pie and recognizes no other nation's claim. But United States interest in Antarctica at the present time is manifesting itself more strongly than that of any other nation. The United States Navy's plan for the aerial mapping of the continent is a vast project, and so is the program of geophysical research being carried out by the United States National Committee of the IGY.

The forthcoming unveiling of Antarctica's interior will represent the end of an era, the final stage of a process made famous by such men as Vasco da Gama and Magellan. This will be the last large-scale reconnaissance mapping of the earth's surface, the end of a great unknown.

One reason for the continued existence of the unknown is Antarctica's remoteness. It is surrounded by larger expanses of water than any other continent. And it lies literally on the road to nowhere. The only air route of potential importance that crosses Antarctica is the great-circle course between Australia and Argentina, a distance of 7,000 uninhabited miles. It is therefore evident that at present Antarctica as a whole is of little strategic importance in communications. Only one part of the continent is an exception —the Palmer Peninsula, which, with its South American opposite, Tierra del Fuego, guards the 600 miles of violent seas known as the Drake Passage. This passage, with its subsidiary the Strait of Magellan, is the only natural open waterway across the Western Hemisphere. Should the Panama Canal be closed, the Drake Passage would have great importance as a sea route. Already it has become a necessary Atlantic-Pacific route for the largest American aircraft carriers, which are too wide for the Panama Canal.

There is yet another possible strategic significance for Antarctica. It arises from the fact that in an age of supersonic air transport and guided missiles the earth becomes so small that any part of its surface above sea level acquires a new importance as a base for control of the air. In a future generation, nations may find it an advantage to maintain bases at this meeting point of oceans. And there is also the fact that weather throughout the Southern Hemisphere is believed to be controlled, to a great degree, by the weather of the Antarctic continent. If, in the future, man succeeds in finding means to control the weather, Antarctic bases will take on additional significance.

There is evidence that the climate is becoming warmer, and there are signs of deglaciation, but it would take several millenniums to melt all of Antarctica's ice (in places 7,000 feet thick), even at the present rate. It has been calculated that if all the ice



Maps drawn by Vincent Kotschar

were melted from Antarctica, the sea level of all the oceans would rise 150 feet, enough to flood the world's seaports.

The Antarctic Continent is fringed with floating ice. Although isolated icebergs have been reported as far north as 45° to 50° S., the northern limit of pack ice is generally confined to 500 miles from the coast. Parts of the coast are bordered with thousands of square miles of shelf ice, which is a mass several hundred feet thick attached to the land and floating upon the sea. In places, such as the Ross Sea, it extends hundreds of miles away from the coast. It is the

floating overflow of the outpourings of the continental glaciers. Occasionally masses of shelf ice break off and float to sea as tabular icebergs, up to 50 miles long.

The economic resources of Antarctica are unknown. A few coal deposits and small mineral veins have been seen by explorers. However, even from present scanty knowledge it is possible to draw several conclusions. First, every known area of comparable size possesses large mineral deposits; it is therefore reasonable to expect them in Antarctica. Second, geological investigations of parts of the Antarctic periphery have shown the rocks to be the type in which mineral deposits are usually found. But even if large mineral resources should be discovered, who would mine them? For riches and adventure men braved the cold of the Yukon; but it would take more than all the Klondike's gold and all the daring of the sourdoughs to strip the overburden of ice from Antarctica. Even if minerals should be found free from ice, the cost of exploitation would be prohibitive by present-day standards.

Survival in the Antarctic interior depends more than anything else upon meticulous attention to detail. Proper functioning of equipment can mean the difference between life and death. For example, loss of dark glasses results in snow blindness. Failure of a stove means no water, for all water must be procured by melting snow. Safety cannot always be assured by carrying spare stoves, for spares are heavy and light weight is essential for travel. Loss of food supplies can mean starvation. Finally, there are the cold and the wind. Frostbite may attack exposed skin without warning when temperatures fall much below 0° F. Heavy exercise causes perspiration, one of man's worst enemies in the Polar Regions. At extremely low temperatures perspiration and breath moisture condense as ice on the inside of clothing and sleeping bags. If these are not dried out with the heat of stoves in closed shelters, or if the ice is not shaken off regularly, it will accumulate until the insulation is destroyed and the wearer becomes incased in the ice of his own perspiration.

No animal life exists in Antarctica that does not feed in the ocean. Small white birds known as snow petrels have been seen within a few hundred miles of the South Pole, but their presence there is evidence only of their great flying range, for they must return to the sea for food. In addition to small birds, the coast is frequented by skua gulls, penguins, and seals. The interior is not entirely lifeless, however; moss, a few small tufts of grass, and a few lichens have been found there.

One form of wildlife is today the only exploitable economic resource of Antarctica. This is the whale. By far the greatest part of the world's whale catch comes from the southern oceans off the Antarctic Continent.

Finally, let us consider the transportation problem. This is a critical problem at present, for Antarctica is still being explored and transport is the key to exploration. Although little is known about the geography of the interior, it is safe to speculate. Wherever the interior has been penetrated so far, the same sort of terrain has been found—endless icy plateaus punctured in places by mountain ranges, most of them half buried in ice thousands of feet thick. It is unlikely that forthcoming exploration will reveal anything very different.

Most of the interior provides a firm and smooth surface for mechanized tracked vehicles and for aircraft landings and take-offs. No vegetation bars the way. No swamps or bogs hinder progress as in the Arctic. The glaciers provide avenues into and across the mountain ranges. The traveler with sufficient fuel can never go thirsty, for a frozen water supply is everywhere at hand.

The greatest obstacle to Antarctic transportation is the cold. It hampers outdoor operations. It causes

---

AMERICAN GEOGRAPHICAL SOCIETY
BROADWAY AT 156TH STREET, NEW YORK 32, N. Y.

Enclosed please find $..... to cover the following (payable in advance):

[ ] subscription(s) to FOCUS ..... year(s) ($1.00 per year*; $1.25 Canada, Alaska, Hawaii).
[ ] copies of the WORLD MAP (75 cents to subscribers).
[ ] copies of the FOCUS BINDER (75 cents each).
[ ] copies each of the following PAST ISSUES of FOCUS (15 cents each**) (listed on page 5).....

* Group subscriptions: 25–49, 90¢ each per year; 50–99, 85¢ each; 100–499, 80¢ each; 500 and over, 75¢ each.
** Bulk rates for separate copies: 250–499 copies, 10¢ each; 500–999, 9¢ each; 1,000 and over, 8¢ each.

Name .....
(PLEASE PRINT)
Street .....
City ..... State .....

lubrication problems for mechanized vehicles. It prevents unencumbered traveling because it forces one to carry elaborate shelters at all times.

As in all other ice-covered localities, crevassed glaciers are prevalent. They are a particularly serious obstacle near the coasts, for here the masses of ice from high on the continental plateaus flow down to the sea. Sea ice can be both an asset and a hindrance. When strong it provides a level coastal highway. When thin or broken it presents obstacles similar to crevasses.

"Coastal barrier" is the common name for the ice cliff that rings Antarctica's shores. It is from 50 to 100 feet high and is broken in only a few places. Because of this, it is the greatest obstacle to the movement of supplies from ship to shore.

Most of the known parts of Antarctica are poorly mapped: a transcontinental trip such as that planned by the British must expect to encounter entire mountain ranges never before seen by man.

The absence of natural supplies forces travelers to carry heavy supplies with them. There are no trees for shelter if tents blow down, no wildlife in the interior if food becomes short, no natives to go to for help in an emergency. The coasts, of course, offer some natural aids. In summer there are pools of meltwater and seals and penguins for food.

In Antarctic transportation the dog team is still prevalent. It is slow. Its daily endurance in terms of working hours is small. Its carrying capacity is limited. But in the face of natural obstacles the dog team is supreme. It requires no protection against the cold. It eats snow for water supply. Most important of all, when sea-ice obstacles or crevasses are encountered, a dog team can be dismantled, transported across piece by piece (dog by dog), and assembled again on the other side.

On recent expeditions the combination of dog team and airplane has proved effective. Airborne supplies enable the dog team to range much greater distances and stay in the field for months at a time on exploratory missions. Sled parties spaced at intervals along the air routes can give weather information by radio. They can obtain ground control for aerial photographic surveys. They can inspect and mark off emergency landing fields. And above all, they can come to the rescue of grounded airmen.

There is much to be said, however, for the mechanized vehicle and its potential value with new technical improvements. Where no serious barriers to surface travel exist, and when the vehicle is near a supply base, it offers more power, speed, and comfort.

Skis are essential for foot travel in Antarctica. Without skis men often sink into the snow so deeply

---

focus is published monthly (except July and August) by the American Geographical Society to provide background facts and geographical interpretations of current world problems and problem areas. Subscription: $1 for 10 issues ($1.25 Canada, Alaska, Hawaii). Copies (folded) of the Society's four-color Map of the World (about five by three feet; equatorial scale 1:30,000,000) may be purchased by all *FOCUS* subscribers at the special discount price of 75 cents each.

The American Geographical Society, a nonprofit institution, was founded in 1852. Its purpose is to collect and disseminate geographical knowledge, and encourage geographical research and exploration. Membership is of seven types: Fellows (annual dues $10); Sustaining Fellows (annual dues $25); Library Membership (annual dues $25); Contributing Fellows (annual dues $100); Life Fellows (contribution $250); Patrons (contribution $1,000); Benefactors (contribution $5,000). The Society is tax-exempt under Section 101 (6) of the Internal Revenue Code. President: Richard U. Light. Director: Charles B. Hitchcock.

Contributing editors to *FOCUS:* G. H. T. Kimble and G. M. Wrigley.

Forthcoming issues of *FOCUS* will deal with Somalia; India's Languages and Religions; and the Federation of Rhodesia.

PREVIOUS ISSUES, dealing with the following, are available at 15 cents each (payable in advance): **AFRICA:** Libya; Ethiopia; Kenya; Nigeria; Belgian Congo; Union of South Africa; Resources of the Tropics I—Africa; Outlook for Arid North Africa: The Sahara. **ASIA:** Korea; Japan; Formosa; Hongkong; Viet Nam; India's Population Problem; Iraq; Turkey; Resources of the Tropics III—Southeast Asia; Ceylon and the Colombo Plan. **EUROPE:** Great Britain; Ireland; Scandinavia; Germany; the Ruhr; Poland; the Netherlands; France; Switzerland; Austria; Spain; Italy. **NORTH AMERICA:** Alaska; Outlook for the Arid Realm of the United States; New York City; Puerto Rico; Water in the United States; Poliomyelitis in the United States. **SOUTH AMERICA:** Venezuela; Resources of the Tropics II—South America. **U.S.S.R.:** Resources I—Heavy Industry; Resources II—Agriculture. **GENERAL:** Outlook for Steel (map only available); Outlook for Wood; Outlook for Rubber; Human Starvation.

Out of Print (photostats available at $1.50 each): U.S.S.R. Oil; Iran; Egypt; Israel; Morocco; Pakistan; Yugoslavia; Resources of the Arctic; The Changing South (U.S.); Outlook for Steel.